B2 Cont. and accordingly require more or fewer taps 122 than that required for the cable of FIGS. 7 and 8. As mentioned before it is difficult to determine a priori what taps 122 are needed with a particular cable.

Please replace the paragraph at page 21, lines 4-9 with the following paragraph:

B3 For the case of the 24 dB threshold, out of 440 initially active taps, only 30 remain active after the application of the tap scanning algorithm, while maintaining a 5dB margin for required bit error rate. Notice from FIGS. 17 and 18 that those taps 122 which remain active occur at sparse locations, and it would have been difficult to statically allocate these taps during the design of the NEXT and echo cancellers, because the location of taps is highly dependent on the specific cable response.

IN THE CLAIMS:

Please amend claim 1 as follows:

B4 1. (Amended) A method of reducing power dissipation in a communications system having at least one adaptive filter having at least one tap, said method comprising:

setting at least one tap threshold; and

dynamically adjusting the at least one tap threshold to allow at least one tap to be activated or deactivated to converge an error to a prespecified acceptable target error.

Please add the following new claims:

61 2. The method of claim 1 wherein dynamically adjusting the at least one tap threshold comprises determining whether to deactivate a tap based upon an adjusted tap threshold.

B5 Rule 121 62 3. The method of claim 2 wherein determining whether to deactivate a tap comprises:

determining a tap error; and

if the tap error is less than a prespecified acceptable level of tap error, deactivating the tap.

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4. The method of claim 2 wherein determining whether to deactivate a tap comprises:

determining a filter error; and

if the filter error is less than a prespecified acceptable filter target error, deactivating the tap.

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5. The method of claim 4 wherein determining the filter error comprises:

determining a tap error for a plurality of taps; and

summing the tap errors determined.

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6. The method of claim 2 wherein determining whether to deactivate a tap comprises:

determining a system error; and

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if the system error is less than a prespecified acceptable communications system target error, deactivating the tap.

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7. The method of claim 6 wherein determining the system error comprises:

determining a filter error for each of a plurality of adaptive filters; and

summing the filter errors determined.

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8. The method of claim 7 wherein the step of determining the filter error comprises:

determining a tap error for each of a plurality of taps; and

summing the tap errors determined.

68

9. The method of claim 1 wherein dynamically adjusting the at least one tap threshold includes determining whether to activate a previously deactivated tap based upon an adjusted tap threshold.

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10. The method of claim 9 wherein the step of determining whether to activate a previously deactivated tap comprises:

periodically activating at least one previously deactivated tap;

computing a tap error; and

if the tap error is less than a prespecified acceptable level of tap error, deactivating the previously deactivated tap.

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11. The method of claim 1 wherein the at least one adaptive filter has a sufficient number of taps to accommodate for delay due to a length of the communications line.

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12. The method of claim 11 wherein a select plurality of taps positioned at an input end of the at least one adaptive filter are not subject to deactivation.

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13. The method of claim 11 further comprising partitioning the taps into a plurality of blocks each having at least one tap and wherein activation and deactivation of adaptive filters is performed on a block-by-block basis.

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14. The method of claim 13 wherein the blocks are adjusted in a sequential manner starting at an input end of at least one adaptive filter.

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15. The method of claim 1 wherein the communications system comprises at least one echo canceller having at least one adaptive filter.

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16. The method of claim 1 wherein the communications system comprises at least one NEXT canceller having at least one adaptive filter.

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17. The method of claim 1 wherein the communications system comprises at least one FEXT canceller having at least one adaptive filter.

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18. The method of claim 1 wherein the error comprises a communication system error and the prespecified acceptable target error comprises a prespecified acceptable communications system target error.

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19. The method of claim 1 wherein the error comprises a filter error and the prespecified acceptable target error comprises a prespecified acceptable filter target error.

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20. The method of claim 1 wherein the error comprises a communication system error differential and the prespecified acceptable target error comprises a prespecified acceptable communications system target error differential.

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21. A method for reducing power dissipation in a communications system having at least one adaptive filter with a plurality of taps, each of the plurality of taps switchable between an active and an inactive state and having a tap coefficient, said method comprising:

a) setting a tap threshold for at least one of the plurality of taps;

b) deactivating at least one active tap having a coefficient with an absolute value less than a tap threshold set for that active tap;

c) determining a filter error;

d) comparing the filter error determined to a prespecified acceptable target error;

e) if the filter error determined is less than the prespecified acceptable target error, increasing the tap threshold for at least one active tap; and

f) repeating b) through e) so that a filter error determined approaches the prespecified acceptable target error.

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22. The method of claim 21 wherein a determination of whether to deactivate a tap is done in a sequential manner starting at an input end of at least one adaptive filter.

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23. The method of claim 21 further comprising activating at least one previously deactivated tap.

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24. The method of claim 23 wherein previously deactivated taps are activated in a sequential manner starting at the input end of at least one adaptive filter.

84

25. The method of claim 21 wherein a plurality of tap thresholds are substantially the same.

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26. The method of claim 21 wherein a plurality of tap thresholds are initially set equal to a tap coefficient having a minimum absolute value.

84

27. The method of claim 21 wherein a plurality of tap thresholds each have a different value.

87

28. The method of claim 21 wherein a plurality of taps are partitioned into a plurality of blocks, each block having at least one tap, and wherein a tap threshold for each tap within each of the blocks is substantially the same.

88

29. The method of claim 21 wherein determining the filter error comprises:

determining a tap error of each of a plurality of individual taps; and

summing the tap errors determined.

89

30. The method of claim 29 wherein the error of each of the plurality of individual taps is a mean square error for the tap and is determined by multiplying an absolute value of a tap coefficient for the tap by an average energy signal.

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31. A method for reducing power dissipation in a communications system having at least one adaptive filter with a plurality of taps, each of the plurality of taps switchable between an active and an inactive state and having a tap coefficient, said method comprising:

a) setting a tap threshold for at least one of the plurality of taps;

b) deactivating at least one active tap having a coefficient with an absolute value less than a tap threshold set for the active tap;

c) determining a system error;

d) comparing the system error determined to a prespecified acceptable target error;

e) if the system error determined is less than the prespecified acceptable target error, increasing the tap threshold for at least one active tap; and

f) repeating step b) through e) so that a system error determined approaches the prespecified acceptable target error.

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91

32. The method of claim 31 wherein a determination of whether to deactivate a tap is done in a sequential manner starting at an input end of at least one adaptive filter.

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33. The method of claim 31 further comprising activating at least one previously deactivated tap.

93

34. The method of claim 33 wherein previously deactivated taps are activated in a sequential manner starting at the input end of at least one adaptive filter.

94

35. The method of claim 31 wherein determining the system error comprises:

determining a filter error of each of a plurality of individual adaptive filters; and

summing the filter errors determined.

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36. The method of claim 35 wherein the step of determining the filter error comprises:

determining a tap error of each of a plurality of individual taps; and

summing the tap errors determined.

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37. The method of claim 36 wherein the tap error of each of the plurality of individual taps is a mean square error for the tap and is determined by multiplying an absolute value of a tap coefficient for the tap by an average energy signal.

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38. The method of claim 31 further comprising:

i) determining an error for at least one active tap; and

ii) if the error determined is less than an acceptable level of error, deactivating the tap.

98

39. The method of claim 38 wherein steps i) and ii) are performed prior to steps a) through e).

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40. A method for reducing power dissipation in a communications system having at least one adaptive filter with a plurality of taps, each of the plurality of taps switchable between an active and an inactive state and having a tap coefficient, said method comprising:

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a) determining a first system error;

b) for at least one active tap, setting a tap threshold;

c) deactivating at least one active tap having a coefficient with an absolute value less than a tap error threshold set for the active tap;

d) determining a second system error;

f) if the difference between the second system error and the first system error is less than a prespecified acceptable communciations system target error, increasing the tap threshold for at least one active tap; and

g) repeating step c) through f) so that a difference between the second system error and the first system error approaches the prespecified acceptable communications system target error.

100

41. The method of claim 40 wherein a determination of whether to deactivate a tap is done in a sequential manner starting at an input end of at least one adaptive filter.

101

42. The method of claim 40 wherein a plurality of tap thresholds are initially set equal to a tap coefficient having a minimum absolute value.

102

43. The method of claim 40 wherein a tap threshold is substantially the same for each of a plurality of taps in at least one adaptive filter.

103

44 A communications system comprising:

at least one adaptive filter responsive to signals carried by a communications line, the at least one adaptive filter having at least one tap switchable between an active and an inactive state;

means for setting a tap threshold;

means for determining a present error for the communications system;

means for comparing the present error to a prespecified acceptable communications system target error; and

means for dynamically adjusting the tap threshold to allow at least one tap to be selectively activated or deactivated to converge an error of the communications system to the prespecified acceptable communications system target error.

104

45. The communications system of claim 44 comprising a plurality of taps wherein the means for setting a tap threshold comprises:

means for comparing for each tap an absolute value of a tap coefficient with at least one tap threshold; and

means for deactivating those taps having a coefficient with an absolute value less than the at least one tap threshold.

105

46. The communications system of claim 45 wherein the means for setting a tap threshold of each tap further comprises means for periodically activating previously deactivated taps.

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47. The communications system of claim 45 further comprising means for increasing a tap threshold when an error is less than the prespecified acceptable communications system target error.

107

48. The communications system of claim 44 comprising a select plurality of taps positioned at an input end of each of a plurality of adaptive filters that are not subject to deactivation.

108

49. The communications system of claim 44 wherein the at least one adaptive filter has a sufficient number of taps to accommodate for signal delay due to a length of a communications line.

109

50. The communications system of claim 44 wherein a plurality of taps are equally spaced within the at least one adaptive filter such that the time between successive sampling of an input signal is substantially equal.

110

51. The communications system of claim 44 wherein the communications system comprises at least one echo canceller having at least one adaptive filter.

111

52. The communications system of claim 44 wherein the communications system comprises at least one NEXT canceller having at least one adaptive filter.

112

53. The communications system of claim 44 wherein the communications system comprises at least one FEXT canceller having at least one adaptive filter.

113

54. A power dissipation reduction system for use in a communications system having at least one adaptive filter having at least one tap switchable between an active and an inactive state, said power dissipation reduction system comprising:

means for setting a tap threshold;

means for determining a present error for the communications system;

means for comparing the present error to a prespecified acceptable communciations system target error; and

means for dynamically adjusting the tap threshold to allow at least one tap to be selectively activated or deactivated to converge an error of the communications system to the prespecified acceptable communications system target error.

114
55. The communications system of claim 54 comprising a plurality of taps and wherein the means for setting a tap threshold comprises:

means for comparing for each tap, an absolute value of a tap coefficient with at least one tap threshold; and

means for deactivating those taps having a coefficient with an absolute value less than the at least one tap threshold.

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56. The communications system of claim 55 wherein the means for setting a tap threshold of each tap further comprises means for periodically activating previously deactivated taps.

116
57. The communications system of claim 55 further comprising means for increasing a tap threshold when an error is less than the prespecified acceptable communications system target error.

117
58. The communications system of claim 55 comprising a select plurality of taps positioned at an input end of each of a plurality of adaptive filters that are not subject to deactivation.

118
59. The communications system of claim 54 wherein a plurality of taps are equally spaced within the at least one adaptive filter such that the time between successive sampling of an input signal is substantially equal.